

CLAIMS

1 - 1. An integrated optical switch for coupling
2 an input optical fiber to an output optical fiber,
3 comprising:
4 a substrate;
5 a first waveguide formed on the substrate;
6 a second waveguide formed on the substrate;
7 an input port located at one end of the second
8 waveguide for operatively receiving the input optical
9 fiber;
10 an output port located at the other end of the
11 second waveguide for operatively receiving the output
12 optical fiber;
13 a first control electrode positioned proximate
14 the first waveguide;
15 a second control electrode positioned proximate
16 the second waveguide;
17 wherein the second waveguide is substantially
18 straight; and,
19 wherein the first waveguide has a bend
20 proximate to the second waveguide such that a directional
21 coupler is formed.

1 2. The optical switch of claim 1 wherein the
2 substrate comprises lithium niobate.

1 3. The optical switch of claim 1 wherein the
2 substrate comprises lithium tantalate.

1 4. The optical switch of claim 1 wherein the
2 first and second waveguides comprise titanium diffused
3 into the substrate.

1 5. The optical switch of claim 1 wherein the
2 first and second waveguides are formed by a proton
3 exchange process.

1 6. A directional coupler for coupling an
2 input optical fiber to an output optical fiber,
3 comprising:

4 a substrate;

5 a first waveguide formed on the substrate,
6 wherein the first waveguide is substantially straight;

7 a second waveguide formed on the substrate,

8 wherein the second waveguide has a bend proximate to the
9 first waveguide such that the first and second waveguides
10 evanescently couple;

11 an input port located at one end of the first
12 waveguide for operatively receiving the input optical
13 fiber;

14 an output port located at the other end of the
15 first waveguide for operatively receiving the output
16 optical fiber;

17 a first control electrode positioned proximate
18 the first waveguide; and,

19 a second control electrode positioned proximate
20 the second waveguide.

1 7. The directional coupler of claim 6 wherein
2 the first and second waveguides are formed between the
3 first and second control electrodes.

1 8. The directional coupler of claim 6 wherein
2 the second control electrode is formed proximate to the
3 bend in the second waveguide.

1 9. The directional coupler of claim 8 wherein
2 the first and second waveguides are formed between the
3 first and second control electrodes.

1 10. The directional coupler of claim 6 wherein
2 the bend is in closer proximity to the first waveguide
3 than is the remainder of the second waveguide.

1 11. The directional coupler of claim 6 wherein
2 the substrate comprises lithium niobate.

1 12. The directional coupler of claim 6 wherein
2 the substrate comprises lithium tantalate.

1 13. The directional coupler of claim 6 wherein
2 the first and second waveguides comprise titanium
3 diffused into the substrate.

1 14. The directional coupler of claim 6 wherein
2 the first and second waveguides are formed by a proton
3 exchange process.

1 15. An optical switch comprising:
2 a substrate;
3 a first waveguide formed on the substrate,
4 wherein the first waveguide is substantially straight;
5 a second waveguide formed on the substrate,
6 wherein the second waveguide has a bend such that the
7 bend of the second waveguide is proximate to the first
8 waveguide;
9 an input port located at one end of the first
10 waveguide;
11 an output port located at the other end of the
12 first waveguide;
13 a first control electrode formed on the
14 substrate and located proximate to the first waveguide;
15 and,
16 a second control electrode positioned formed on
17 the substrate and located proximate the second waveguide.

1 16. The directional coupler of claim 15
2 wherein the first and second waveguides are formed
3 between the first and second control electrodes.

1 17. The directional coupler of claim 15
2 wherein the second control electrode is formed proximate
3 to the bend in the second waveguide.

1 18. The directional coupler of claim 17
2 wherein the first and second waveguides are formed
3 between the first and second control electrodes.

1 19. The directional coupler of claim 15
2 wherein the bend is in closer proximity to the first
3 waveguide than is the remainder of the second waveguide.

1 20. The directional coupler of claim 15
2 wherein the substrate comprises lithium niobate.

1 21. The directional coupler of claim 15
2 wherein the substrate comprises lithium tantalate.

1 22. The directional coupler of claim 15
2 wherein the first and second waveguides comprise titanium
3 diffused into the substrate.

1 23. The directional coupler of claim 15
2 wherein the first and second waveguides are formed by a
3 proton exchange process.

1 24. The directional coupler of claim 15
2 wherein the bend comprises a C-shaped bend in the second
3 waveguide, and wherein the C-shaped bend wraps around the
4 second control electrode.

1 25. The directional coupler of claim 24
2 wherein the first and second waveguides are formed
3 between the first and second control electrodes.

1 26. The directional coupler of claim 25
2 wherein the bend is in closer proximity to the first
3 waveguide than is the remainder of the second waveguide.